DEPARTMENT OF PSYCHOLOGY

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Dr. Elliott Levinthal
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SUMEX-AIM Computer Project
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Dear Drs. Feigenbaum and Levinthal:

This letter contains a brief outline of our application for SUMEX-AIM plus additional supporting material. If you find that the enclosed material is adequate for submission to the SUMEX-AIM Advisory Group, please inform us over the ARPANET (Polson at CMUA). We will then send the required 13 copies. We are also willing to make any suggested modifications or additions to these materials.

This application requests SUMEX-AIM access for two related research programs here at Colorado. The first project, on memory and comprehension of text, has been going on for over ten years under the direction of Walter Kintsch. The second is a research program on the processes of planning that started approximately nine months ago under the direction of Peter Polson.

We have partitioned our material into four sections. In Section 1, Walter Kintsch describes the history of his research project on comprehension and memory for text. He has also included with this application a reprint of a recent Psychological Review article published with Professor Teun van Dijk that describes his most recent work. Kintsch requires access to SUMEX-AIM for two aspects of his theoretical work. The first is rather short term. He wants to use the SUMEX facilities to calculate predictions for a particular aspect of his text model using a LISP program developed by one of his students. His second need

is far more long range. Kintsch's research up to this point has focused on developing models of various components of the processes involved in the comprehension and representation of text. Kintsch proposes that a HEARSAY-like theoretical structure could be employed to integrate the various components and enable him to validate the overall structure of the theoretical framework he has developed by demonstrating that these processes can be integrated into a complete model of comprehension.

In Section 2, Dr. James Miller, a Research Associate working with Dr. Kintsch, describes in some detail how a HEARSAY-like theoretical structure could be used to formalize the various processes that have been developed by Kintsch and his co-workers. Dr. Miller works out some particular examples involving the kinds of macrostructure generation rules that have been described by Kintsch and van Dijk.

Section 3 was drafted by Peter Polson and Dr. Robin Jeffries. They describe their research on planning: the experimental tasks used in this research, their results, and some of their tentative notions on how to develop a HEARSAY-like model for the planning process.

Section 4 contains our responses to the questionnaire that was incorporated with the application material for SUMEX usage. We have given what we feel are fairly reasonable estimates of our needs during the first year or two of our usage of the SUMEX-AIM facility. We anticipate that during the first six to eight months we would spend a significant amount of time learning INTERLISP, learning to use the AGE-0 system, and mastering the basic techniques necessary to construct models of the processes outlined in the first three sections. Our estimate of our total impact on SUMEX resources is that during the first year, we would use all the connect time that we have requested. However, our CPU utilization will not be large during this first year, because we will not yet be sophisticated enough to develop the complex kinds of models that would dramatically impact the CPU load. After the first six month period, we would begin to construct a series of small models that attempt to simulate components of the more general processes that we have outlined. Gradually, the size and scope of these models would increase, and in later years we may require a larger amount of the SUMEX resources to run our simulations of the overall processes involved in text comprehension and planning. We would, of course, be willing to do much of this work in off-peak hours.

We hope that interactions between these projects will enable us to illuminate issues of where general comprehension processes interface with the kinds of knowledge structures that underlie expertise in a specialized domain like software design. We think that the attempt to clarify such interactions may give us a great deal of information about general processes that underlie the utilization of knowledge in any domain.

We thank you for your assistance in preparing this application for SUMEX-AIM access.

Sincerely yours,

Walter Kintsch

Walter Kintsch
Professor

Peter G Polson

Peter G. Polson
Professor

WK:pb